Size R0.5～R6

DCB

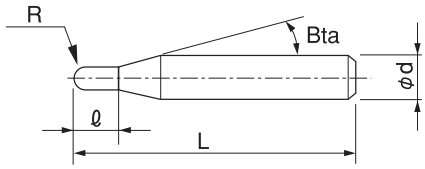
MG DIA 35° R ±0.01 Shank Dia 0/-0.005

Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels ～50HRC	Hardened Steels ～55HRC	Hardened Steels ～60HRC	Hardened Steels ～65HRC	Hardened Steels ～70HRC	Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
									○	★	○	○	●				○

Features

Diamond coated 2 flute ball end mills for Graphite Electrode milling.
New diamond coating with a highly adhesive base layer offers excellent wear resistance and longer tool life.



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

Total 9 models

Unit (mm)

Model Number	Radius of Ball Nose R	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥
DCB 2010	R0.5	5	16°	60	4	16,000
DCB 2020	R1	10	16°	70	4	17,000
DCB 2030	R1.5	15	16°	80	4	21,000
DCB 2040	R2	20	—	100	4	24,000
DCB 2050	R2.5	20	—	100	5	28,000
DCB 2060	R3	30	—	150	6	41,500
DCB 2080	R4	40	—	150	8	45,000
DCB 2100	R5	50	—	180	10	57,500
DCB 2120	R6	55	—	180	12	87,500

Milling Conditions for DCB

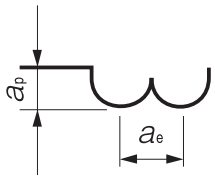
WORK MATERIAL		GRAPHITE			
Model Number	Radius of Ball Nose (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2010	**R0.5**	10,000	140	0.1	0.3
2020	**R1**	10,000	300	0.2	0.6
2030	**R1.5**	10,000	900	0.3	0.9
2040	**R2**	10,000	900	0.4	1.2
2050	**R2.5**	10,000	1,200	0.5	1.5
2060	**R3**	10,000	1,460	0.6	1.8
2080	**R4**	7,500	1,350	0.8	2.4
2100	**R5**	6,000	1,440	1	3
2120	**R6**	5,000	1,400	1.2	3.6

◆ High speed milling

WORK MATERIAL		GRAPHITE			
Model Number	Radius of Ball Nose (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2010	**R0.5**	50,000	700	0.1	0.3
2020	**R1**	45,000	1,350	0.2	0.6
2030	**R1.5**	30,000	2,700	0.3	0.9
2040	**R2**	22,500	2,025	0.4	1.2
2050	**R2.5**	18,000	2,160	0.5	1.5
2060	**R3**	15,000	2,190	0.6	1.8
2080	**R4**	11,500	2,300	0.8	2.4
2100	**R5**	9,000	2,340	1	3
2120	**R6**	7,500	2,250	1.2	3.6

Note:
・Use a milling machine dedicated for Graphite.
・Recommend air blow for Graphite.

For 3D milling / Finishing
Milling Amount (mm)



DCB Series
Aluminum:A7075
Milling Video

DCB Series
Graphite:TTK-5(80HS)
Milling Video

Size R0.2～R3

DCLB

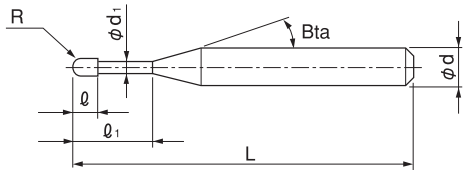
MG DIA 35° R ±0.01 Shank Dia 0/-0.005

Material Applications（★ Highly Recommended ● Recommended ○ Suggested）

Work Material																	
Carbon Steels	Alloy Steels	Prehardened Steels	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
S45C S55C	SK / SCM SUS	NAK HPM	～50HRC	～55HRC	～60HRC	～65HRC	～70HRC										
									○	★	○	○	●				○

Features

Diamond coated 2 flute long neck ball end mills for Graphite Electrodes.
A highly adhesive coating base, offers long tool life and excellent wear resistance.



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

Total 68 models

Unit（mm）

Model Number	Radius of Ball Nose R	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥	Effective Length by Inclined Angles				
									30′	1°	1° 30′	2°	3°
DCLB 2004-0020	R0.2	2	0.32	0.37	16°	45	4	13,000	2.24	2.41	2.54	2.65	2.85
DCLB 2004-0030		3				45	4	13,000	3.33	3.52	3.67	3.80	4.08
DCLB 2004-0040		4				45	4	13,000	4.39	4.61	4.78	4.94	5.30
DCLB 2004-0050		5				45	4	13,000	5.45	5.69	5.88	6.08	6.52
DCLB 2005-0020	R0.25	2	0.4	0.47	16°	45	4	13,000	2.29	2.49	2.64	2.78	3.01
DCLB 2005-0030		3				45	4	13,000	3.39	3.61	3.79	3.95	4.24
DCLB 2005-0060		6				45	4	13,000	6.59	6.89	7.13	7.37	7.91
DCLB 2005-0100		10				45	4	13,000	10.78	11.16	11.53	11.93	12.80
DCLB 2006-0020	R0.3	2	0.48	0.57	16°	45	4	13,000	2.33	2.55	2.73	2.89	3.16
DCLB 2006-0030		3				45	4	13,000	3.44	3.70	3.90	4.08	4.40
DCLB 2006-0040		4				45	4	13,000	4.53	4.82	5.05	5.24	5.62
DCLB 2006-0060		6				45	4	13,000	6.67	7.01	7.28	7.52	8.07
DCLB 2006-0100		10				45	4	13,000	10.89	11.31	11.68	12.08	12.96
DCLB 2006-0120		12				45	4	13,000	12.98	13.44	13.88	14.36	15.41
DCLB 2008-0100	R0.4	10	0.64	0.77	16°	45	4	13,000	10.88	11.30	11.67	12.07	12.94
DCLB 2008-0120		12				50	4	13,000	12.97	13.43	13.87	14.34	15.39
DCLB 2008-0160		16				50	4	13,000	17.13	17.69	18.27	18.90	20.28

φ3mm Shank V Series
UDC·PCD Series
CBN Series
Square
Square
Long Neck Square
Radius
Radius
Long Neck Radius
Taper Neck Radius
Ball / Long Shank Ball
Ball
Long Neck Ball
Taper Neck Ball
Taper
Taper
Barrel
Spiral V Cutter
Drill
Technical Data

Next Page ➡

Unit (mm)

Model Number	Radius of Ball Nose R	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥	Effective Length by Inclined Angles				
									30′	1°	1° 30′	2°	3°
DCLB 2010-0030	R0.5	3	0.8	0.96	16°	45	4	13,000	3.45	3.69	3.89	4.06	4.37
DCLB 2010-0050		5				45	4	13,000	5.61	5.91	6.16	6.37	6.81
DCLB 2010-0060		6				45	4	13,000	6.67	7.01	7.27	7.51	8.04
DCLB 2010-0080		8				45	4	13,000	8.79	9.17	9.47	9.78	10.48
DCLB 2010-0100		10	1.5			60	4	13,000	10.89	11.31	11.67	12.06	12.93
DCLB 2010-0100-08		10	0.8			45	4	13,000	10.89	11.31	11.67	12.06	12.93
DCLB 2010-0120		12				50	4	13,000	12.98	13.44	13.87	14.34	15.38
DCLB 2010-0160		16				50	4	13,000	17.14	17.70	18.27	18.89	20.27
DCLB 2010-0200		20	1.5			60	4	13,000	21.28	21.95	22.68	23.45	25.17
DCLB 2015-0060	R0.75	6	1.2	1.44	16°	45	4	15,000	6.14	6.32	6.51	6.71	7.16
DCLB 2015-0100		10				45	4	15,000	10.27	10.58	10.91	11.27	12.06
DCLB 2015-0160		16				50	4	15,000	16.46	16.97	17.51	18.10	19.40
DCLB 2020-0040	R1	4	1.6	1.9	16°	45	4	13,000	4.13	4.23	4.34	4.46	4.73
DCLB 2020-0060		6				45	4	13,000	6.19	6.36	6.54	6.74	7.17
DCLB 2020-0080		8				45	4	13,000	8.25	8.49	8.74	9.02	9.62
DCLB 2020-0100		10				45	4	13,000	10.31	10.62	10.94	11.29	12.07
DCLB 2020-0120		12				45	4	13,000	12.38	12.75	13.15	13.57	14.52
DCLB 2020-0160		16				50	4	13,000	16.50	17.01	17.55	18.12	19.41
DCLB 2020-0200-16		20				60	4	13,000	20.63	21.27	21.95	22.68	No Interference
DCLB 2020-0200		20	3			70	4	13,000	20.63	21.27	21.95	22.68	No Interference
DCLB 2020-0250		25	1.6			65	4	13,000	25.79	26.59	27.45	28.37	No Interference
DCLB 2020-0250-30		25	3			65	4	13,000	25.79	26.59	27.45	28.37	No Interference
DCLB 2020-0300-16		30	1.6			70	4	13,000	30.94	31.92	32.95	No Interference	No Interference
DCLB 2020-0300		30	3			70	4	13,000	30.94	31.92	32.95	No Interference	No Interference
DCLB 2020-0350		35		1.91	16°	70	4	13,000	36.09	37.23	38.45	No Interference	No Interference
DCLB 2020-0400		40	1.6			80	4	13,500	41.25	42.55	No Interference	No Interference	No Interference
DCLB 2030-0160	R1.5	16	2.4	2.9	16°	60	6	15,000	16.49	16.98	17.50	18.06	19.30
DCLB 2030-0200		20				60	6	15,000	20.61	21.23	21.90	22.61	24.20
DCLB 2030-0250		25				70	6	17,000	25.77	26.56	27.40	28.30	30.31
DCLB 2030-0300		30	4.5			80	4	13,500	30.93	No Interference	No Interference	No Interference	No Interference
DCLB 2030-0300-S6		30	2.4			80	6	17,000	30.93	31.88	32.90	34.00	No Interference
DCLB 2030-0400-S6		40				80	6	18,500	41.24	42.53	43.91	No Interference	No Interference
DCLB 2030-0400		40	4.5			80	4	15,000	41.24	No Interference	No Interference	No Interference	No Interference
DCLB 2040-0160	R2	16	3.2	3.9	16°	70	6	16,500	16.47	16.94	17.45	17.99	19.19
DCLB 2040-0200		20				70	6	16,500	20.60	21.20	21.85	22.54	No Interference
DCLB 2040-0250		25				70	6	16,500	25.75	26.53	27.35	28.24	No Interference
DCLB 2040-0300		30				70	6	16,500	30.91	31.85	32.85	No Interference	No Interference
DCLB 2040-0300-60		30	6		–	100	4	18,500	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2040-0400-S6		40	3.2		16°	90	6	18,500	41.22	42.50	No Interference	No Interference	No Interference
DCLB 2040-0400		40	6		–	100	4	18,500	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2040-0500-S6		50	3.2		16°	100	6	19,800	51.54	53.15	No Interference	No Interference	No Interference
DCLB 2040-0500		50	6		–	100	4	19,000	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2040-0600		60		3.91	–	100	4	19,000	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2050-0200	R2.5	20	4	4.8	16°	70	6	16,500	20.76	21.36	21.99	No Interference	No Interference
DCLB 2050-0300		30				80	6	17,000	31.08	32.00	No Interference	No Interference	No Interference
DCLB 2060-0300	R3	30	4.8	5.7	–	80	6	17,000	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2060-0400		40				100	6	19,800	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2060-0500		50				120	6	19,800	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2060-0600		60				120	6	23,000	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2060-0700		70		5.71	–	120	6	23,000	No Interference	No Interference	No Interference	No Interference	No Interference
DCLB 2060-0800		80				120	6	25,300	No Interference	No Interference	No Interference	No Interference	No Interference

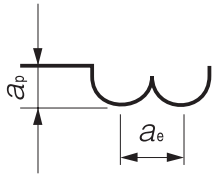
Milling Conditions for DCLB

WORK MATERIAL			GRAPHITE			
Model Number	Radius of Ball Nose (mm)	Effective Length (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2004-0020	**R0.2**	2	33,500	1,100	0.1	0.04
2004-0030		3	33,500	1,100	0.09	0.04
2004-0040		4	33,500	1,100	0.08	0.04
2004-0050		5	33,500	1,100	0.06	0.04
2005-0020	**R0.25**	2	33,500	1,200	0.11	0.05
2005-0030		3	33,500	1,200	0.1	0.05
2005-0060		6	33,500	1,200	0.07	0.05
2005-0100		10	33,500	1,200	0.03	0.05
2006-0020	**R0.3**	2	33,500	1,300	0.15	0.06
2006-0030		3	33,500	1,300	0.13	0.06
2006-0040		4	33,500	1,300	0.12	0.06
2006-0060		6	33,500	1,300	0.1	0.06
2006-0100		10	33,500	1,300	0.04	0.06
2006-0120		12	33,500	1,300	0.04	0.06
2008-0100	**R0.4**	10	33,500	1,400	0.13	0.08
2008-0120		12	33,500	1,400	0.1	0.08
2008-0160		16	33,500	1,400	0.08	0.08
2010-0030	**R0.5**	3	33,500	1,500	0.2	0.1
2010-0050		5	33,500	1,500	0.19	0.1
2010-0060		6	33,500	1,500	0.19	0.1
2010-0080		8	33,500	1,500	0.18	0.1
2010-0100(-08)		10	33,500	1,500	0.16	0.1
2010-0120		12	33,500	1,500	0.15	0.1
2010-0160		16	33,500	1,500	0.12	0.1
2010-0200		20	33,500	1,500	0.1	0.1
2015-0060	**R0.75**	6	30,000	1,500	0.35	0.15
2015-0100		10	30,000	1,500	0.3	0.15
2015-0160		16	30,000	1,500	0.25	0.15
2020-0040	**R1**	4	27,000	1,500	0.5	0.2
2020-0060		6	27,000	1,500	0.49	0.2
2020-0080		8	27,000	1,500	0.48	0.2
2020-0100		10	27,000	1,500	0.46	0.2
2020-0120		12	27,000	1,500	0.43	0.2
2020-0160		16	27,000	1,500	0.38	0.2
2020-0200(-16)		20	27,000	1,500	0.24	0.2
2020-0250(-30)		25	27,000	1,500	0.19	0.2
2020-0300(-16)		30	27,000	1,500	0.12	0.2
2020-0350		35	27,000	1,500	0.11	0.2
2020-0400		40	27,000	1,500	0.09	0.2

Milling Conditions for DCLB

WORK MATERIAL			GRAPHITE			
Model Number	Radius of Ball Nose (mm)	Effective Length (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2030-0160	**R1.5**	16	18,000	1,650	0.5	0.45
2030-0200		20	18,000	1,650	0.44	0.45
2030-0250		25	18,000	1,650	0.36	0.45
2030-0300(-S6)		30	18,000	1,650	0.3	0.45
2030-0400(-S6)		40	18,000	1,650	0.2	0.45
2040-0160	**R2**	16	13,500	1,750	0.7	0.6
2040-0200		20	13,500	1,750	0.65	0.6
2040-0250		25	13,500	1,750	0.55	0.6
2040-0300		30	13,500	1,750	0.5	0.6
2040-0300(-60)		30	13,500	1,750	0.5	0.6
2040-0400(-S6)		40	13,500	1,750	0.4	0.6
2040-0500(-S6)		50	13,500	1,750	0.24	0.6
2040-0600		60	13,500	1,750	0.18	0.6
2050-0200	**R2.5**	20	10,800	1,600	0.8	0.75
2050-0300		30	10,800	1,600	0.6	0.75
2060-0300	**R3**	30	9,000	1,400	0.9	0.9
2060-0400		40	9,000	1,400	0.75	0.9
2060-0500		50	9,000	1,400	0.6	0.9
2060-0600		60	9,000	1,400	0.51	0.9
2060-0700		70	9,000	1,400	0.4	0.9
2060-0800		80	9,000	1,400	0.23	0.9

Note:
・Use a milling machine dedicated for Graphite.
・Decrease the feed rate more than 50% from the milling parameters when slot milling.
・Recommend air blow for Graphite.



Size R0.5～R1

DCTNB

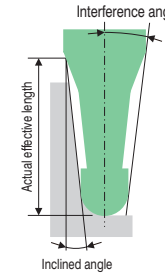
MG DIA 35° R ±0.01 Shank Dia 0/-0.005

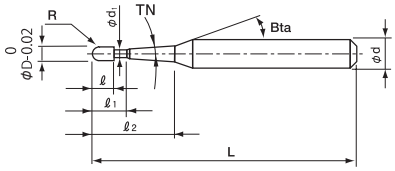
Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels ～50HRC	Hardened Steels ～55HRC	Hardened Steels ～60HRC	Hardened Steels ～65HRC	Hardened Steels ～70HRC	Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
									○	★	○	○	●				○

Features

2 Flute Diamond coated Taper Neck Ball End Mills for Graphite Electrodes.
Taper Neck design improves the tool rigidity and provides high-efficiency & high-precision milling.
Original and optimized Diamond coating offers outstanding resistance to wear on Graphite.
Excellent adhesion coating with long-life tool design.





The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

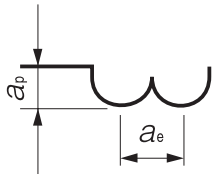
Total 15 models

Unit (mm)

Model Number	Radius of Ball Nose R	Neck Taper Angle TN	Neck Length ℓ2	Effective Length ℓ1	Length of Cut ℓ	Neck Diameter φd1	Shank Taper Angle Bta	Overall Length L	Shank Diameter φd	Suggested Retail Price ¥	Interference Angle	Effective Length by Inclined Angles －: Interference 30′	1°	1°30′	2°	3°
DCTNB 2010-200-1.8	R0.5	0.9°	20	4	0.8	0.96	16°	80	6	18,730	5.25°	－	20.24	20.90	21.61	23.20
DCTNB 2010-250-1.8			25					80	6	21,850	4.48°	－	25.27	26.10	26.99	28.98
DCTNB 2010-400-1.8			40					100	6	25,470	3.11°	－	40.36	41.70	43.13	46.32
DCTNB 2010-600-1.8			60					120	6	33,220	2.21°	－	60.49	62.50	64.65	No Interference
DCTNB 2010-700-1.8			70					120	6	33,220	1.93°	－	70.55	72.90	No Interference	No Interference
DCTNB 2010-800-1.8			80					140	6	33,490	1.72°	－	80.62	83.30	No Interference	No Interference
DCTNB 2010-900-1.8			90					150	6	35,230	1.54°	－	90.68	93.71	No Interference	No Interference
DCTNB 2020-200-1.8	R1	0.9°	20	7	1.6	1.9	16°	80	6	18,730	4.55°	－	20.34	21.00	21.69	23.25
DCTNB 2020-250-1.8			25					80	6	21,850	3.84°	－	25.38	26.20	27.08	29.03
DCTNB 2020-400-1.8			40					100	6	25,470	2.61°	－	40.47	41.80	43.22	No Interference
DCTNB 2020-450-1.8			45					100	6	25,470	2.36°	－	45.51	47.00	48.60	No Interference
DCTNB 2020-600-1.8			60					120	6	33,220	1.83°	－	60.59	62.59	No Interference	No Interference
DCTNB 2020-700-1.8			70					120	6	33,220	1.59°	－	70.66	73.00	No Interference	No Interference
DCTNB 2020-800-1.8			80					140	6	33,490	1.41°	－	80.72	No Interference	No Interference	No Interference
DCTNB 2020-10001.8			100					150	6	37,910	1.15°	－	100.85	No Interference	No Interference	No Interference

Milling Conditions for DCTNB

WORK MATERIAL			GRAPHITE			
Model Number	Radius of Ball Nose (mm)	Neck Length (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
2010-200-1.8	**R0.5**	20	30,000	1,500	0.1	0.12
2010-250-1.8		25	30,000	1,500	0.08	0.12
2010-400-1.8		40	27,000	1,200	0.07	0.12
2010-600-1.8		60	23,000	800	0.06	0.12
2010-700-1.8		70	20,000	600	0.05	0.12
2010-800-1.8		80	18,000	500	0.04	0.12
2010-900-1.8		90	15,000	400	0.03	0.12
2020-200-1.8	**R1**	20	27,000	2,000	0.24	0.5
2020-250-1.8		25	27,000	2,000	0.19	0.5
2020-400-1.8		40	27,000	2,000	0.13	0.4
2020-450-1.8		45	27,000	2,000	0.11	0.4
2020-600-1.8		60	23,000	1,500	0.1	0.3
2020-700-1.8		70	20,000	1,200	0.09	0.3
2020-800-1.8		80	17,000	900	0.09	0.2
2020-10001.8		100	14,000	600	0.09	0.2



Note:
- Use a milling machine dedicated for Graphite.
- Decrease the feed rate more than 50% from the milling parameters when slot milling.
- Recommend air blow for Graphite.

Other series for Graphite milling

Square / Long Neck Square

(★ Highly Recommended ● Recommended ○ Suggested)

Number of Flutes, Tool Type	Model Number	Appearance	Coating	Size	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Hard Brittle (Non-Metallic) Materials	Page
4 flutes Square	**CGE**		Non-coat	φ2～φ20	○	★	○	○	○		236
2 flutes Square	**DCES 2000**		DIA	φ0.2～φ6	○	★	○	○	●	○	188
4 flutes Square	**DCES 4000**		DIA	φ3～φ10	○	★	○	○	●	○	234
2 flutes Long Neck Square	**DCLS**		DIA	φ0.4～φ6	○	★	○	○	●	○	266

Long Neck Radius

4 flutes Long Neck Radius	**DCLRS**		DIA	φ1～φ6	○	★	○	○	●	○	396

Ball / Long Neck Ball / Taper Neck Ball

2 flutes Ball	**CGB 2000**		Non-coat	R0.2 ～ R6	○	★	○	○	○		440
4 flutes Ball	**CGB 4000**		Non-coat	R2 ～ R10	○	★	○	○	○		458
2 flutes Ball	**DCB**		DIA	R0.5 ～ R6	○	★	○	○	●	○	438
2 flutes Long Neck Ball	**DCLB**		DIA	R0.2 ～ R3	○	★	○	○	●	○	512
2 flutes Taper Neck Ball	**DCTNB**		DIA	R0.5 ～ R1	○	★	○	○	●	○	556